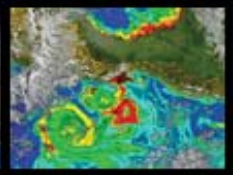
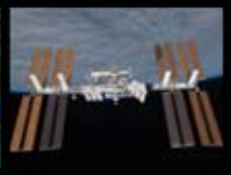
National Aeronautics and Space Administration

Engineering Innovations for Exploration Challenges

marshall





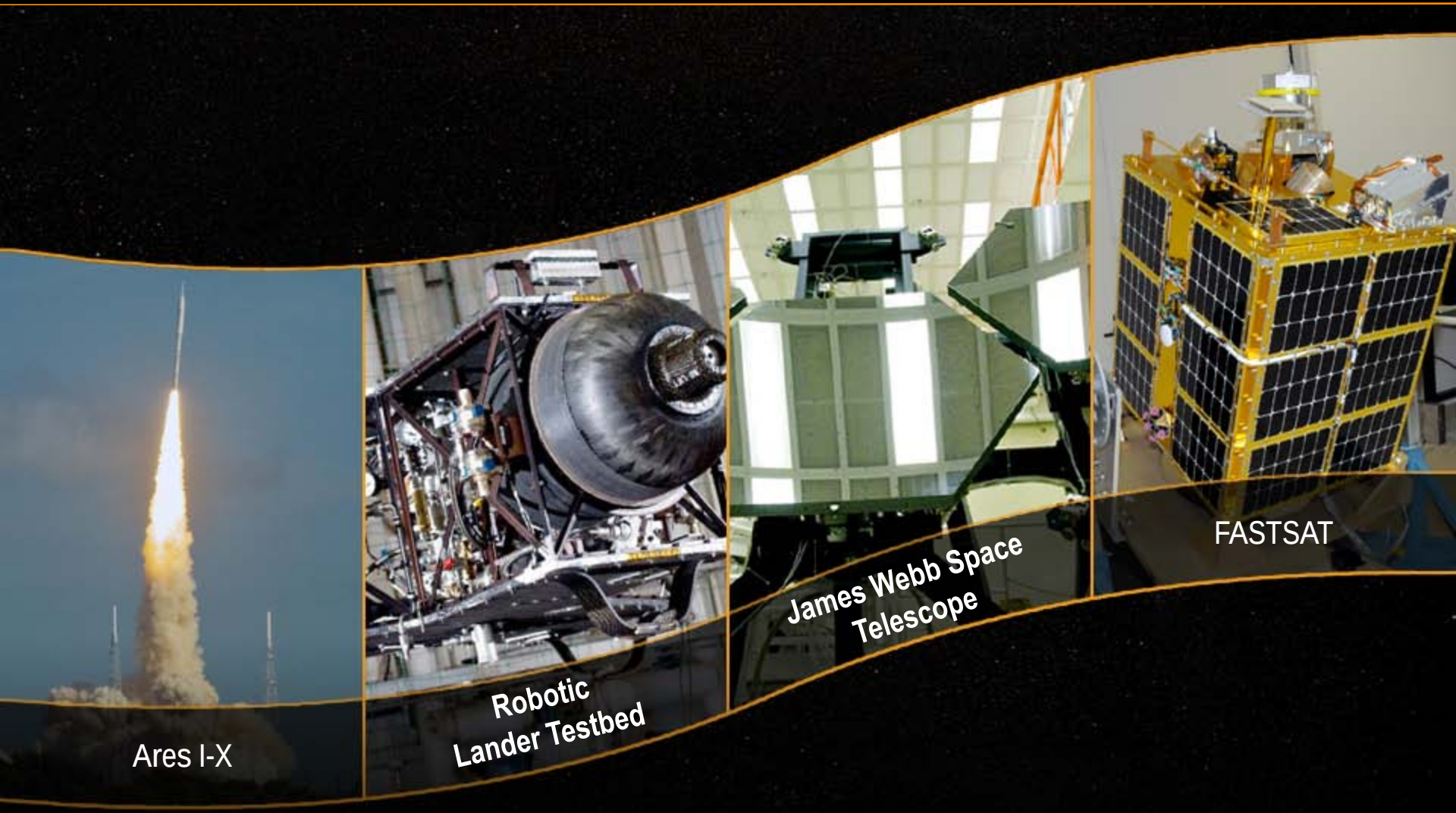
Daniel L. Dumbacher, Engineering Director
NASA Marshall Space Flight Center
May 11, 2010

www.nasa.gov

Agenda

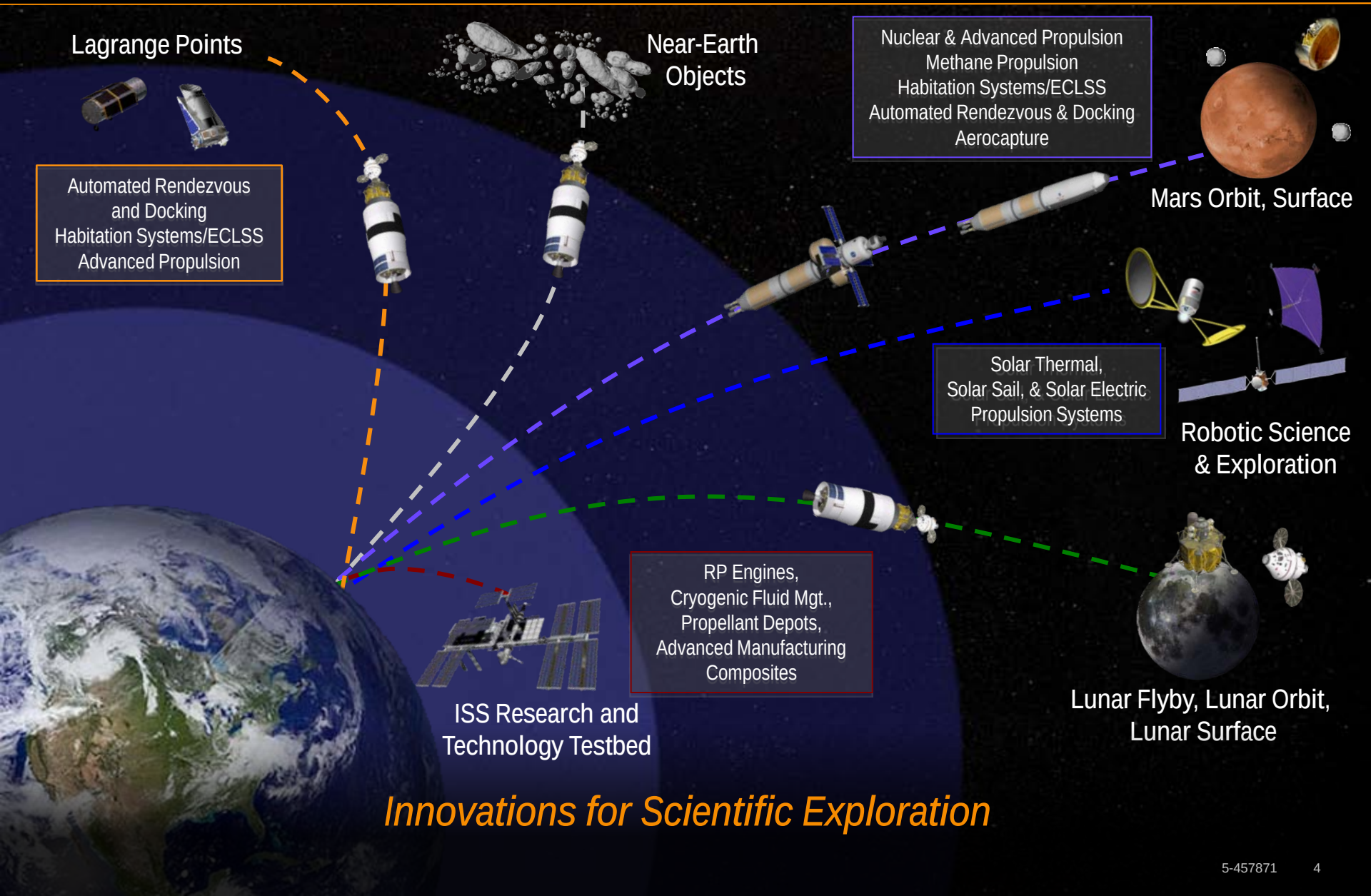
- 2009 Highlights
- Many Places to Explore
- Space Exploration Enterprise
- Marshall's Missions
- Project Lifecycle Management Model
- Sustainable Long-term Program
- Building Block Approach
- Defining the Path Forward
- Mars In Sight

2009 Highlights



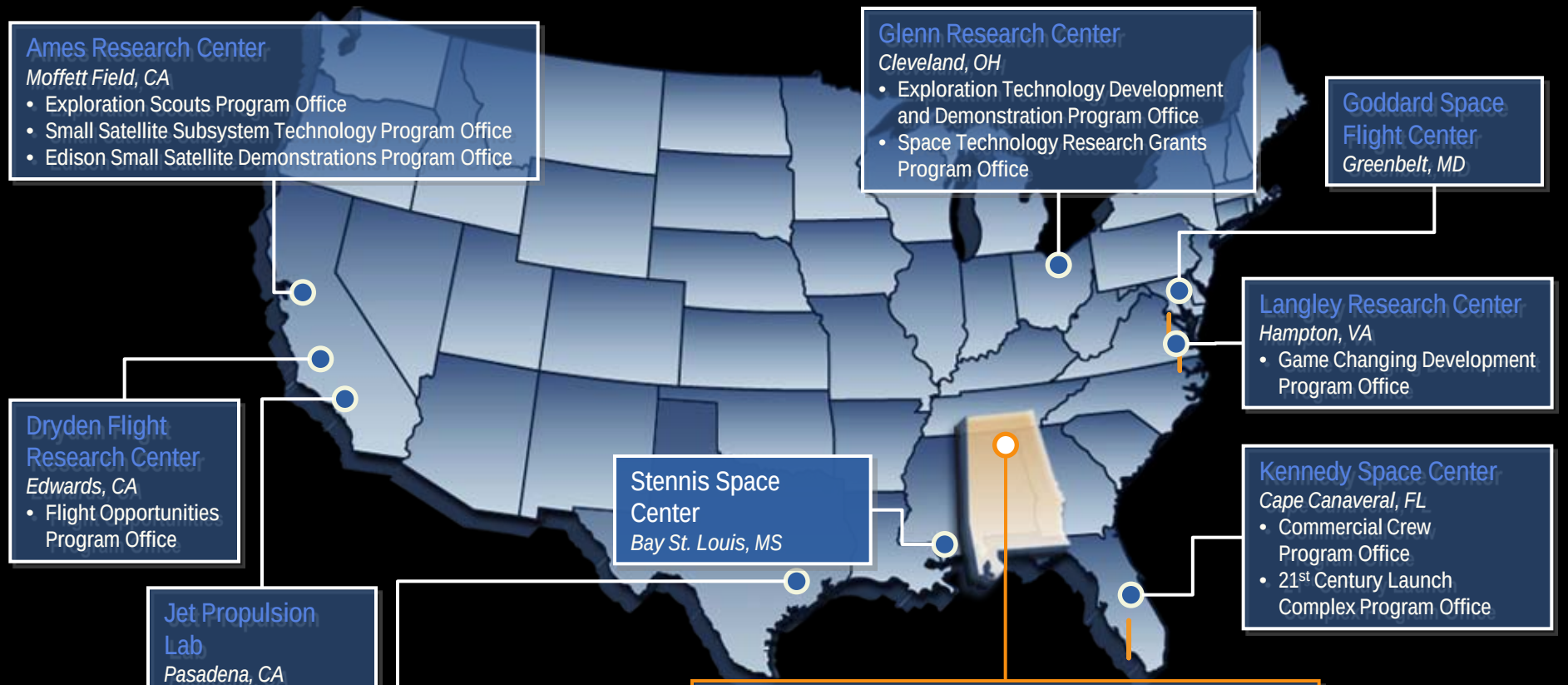
Significant Successes in Space Transportation, Exploration, and Science

Many Places to Explore



Innovations for Scientific Exploration

Space Exploration Enterprise



Ames Research Center
Moffett Field, CA
- Exploration Scouts Program Office
- Small Satellite Subsystem Technology Program Office
- Edison Small Satellite Demonstrations Program Office

Glenn Research Center
Cleveland, OH
- Exploration Technology Development and Demonstration Program Office
- Space Technology Research Grants Program Office

Goddard Space Flight Center
Greenbelt, MD

Langley Research Center
Hampton, VA
- Game Changing Development Program Office

Dryden Flight Research Center
Edwards, CA
- Flight Opportunities Program Office

Stennis Space Center
Bay St. Louis, MS

Kennedy Space Center
Cape Canaveral, FL
- Commercial Crew Program Office
- 21st Century Launch Complex Program Office

Jet Propulsion Lab
Pasadena, CA

Johnson Space Center
Houston, TX
- Flagship Technology
- Demonstration Program Office

Marshall Space Flight Center
Huntsville, AL
- Heavy Lift Propulsion Research and Development Program Office
- Exploration Precursor Robotic Program Office
- Space Technology Demonstrations Program Office
- Centennial Challenges Program Office

Government, Industry, and Academia Working Together

Marshall's Missions

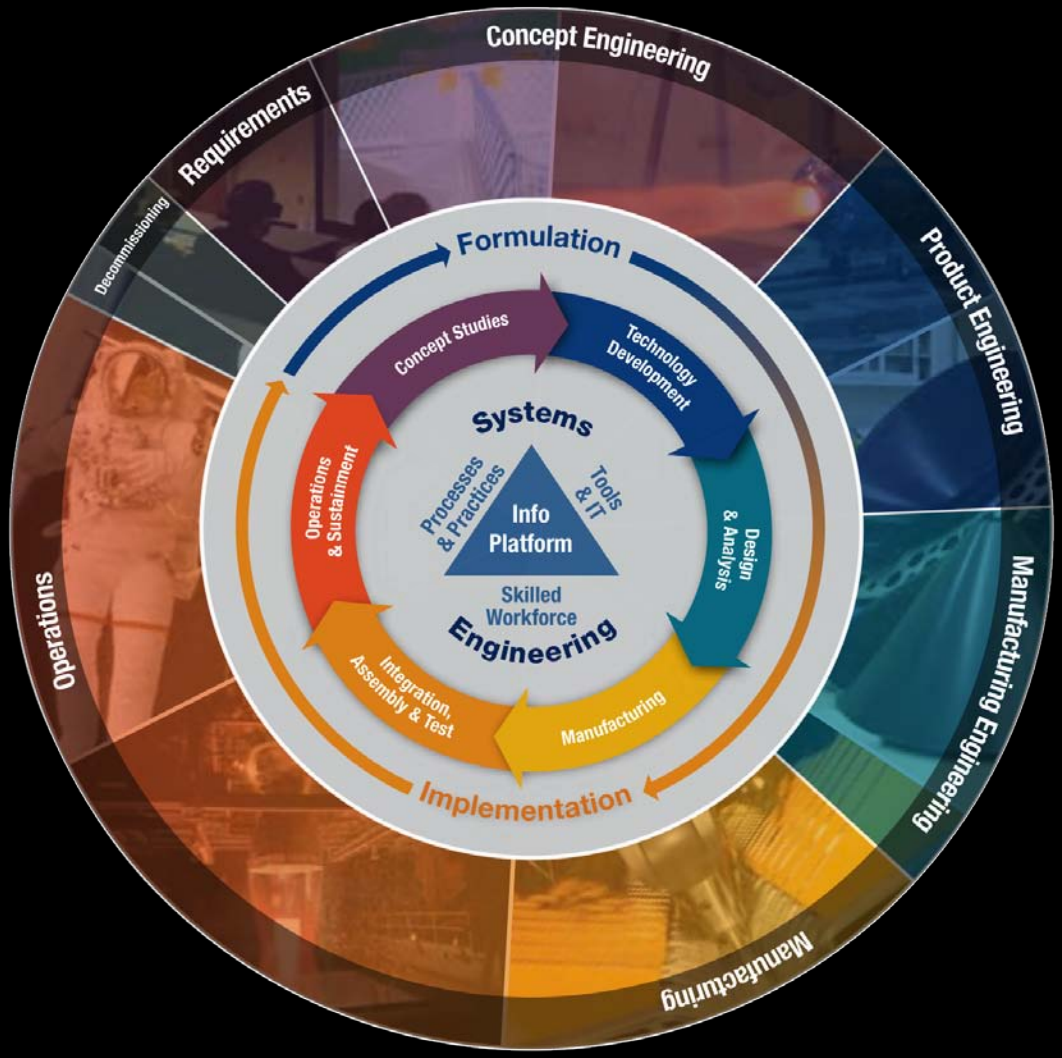
Earth and Space Science Spacecraft, Systems, and Operations

Life Support Systems

Propulsion and Transportation Systems

Making Possible Human and Scientific Space Exploration

Project Lifecycle Management Model

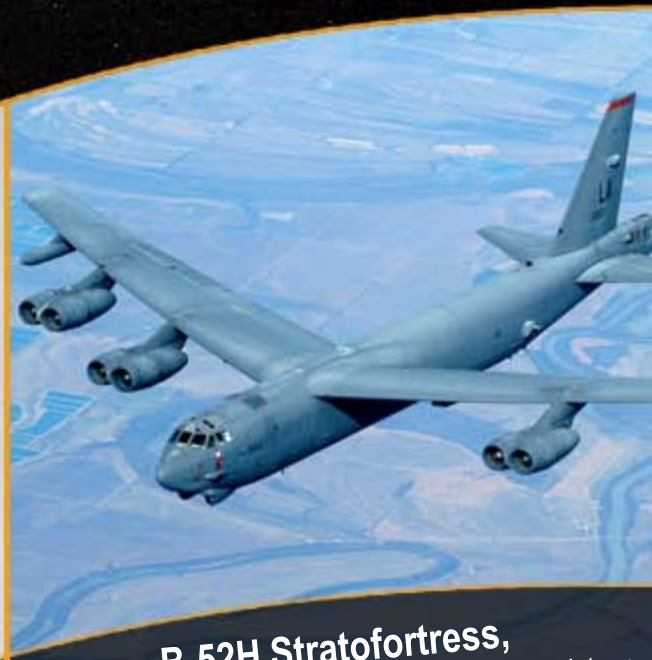


Reducing Undefined, but Known, Risks

Sustainable Long-term Program

B-52Bs, 1957

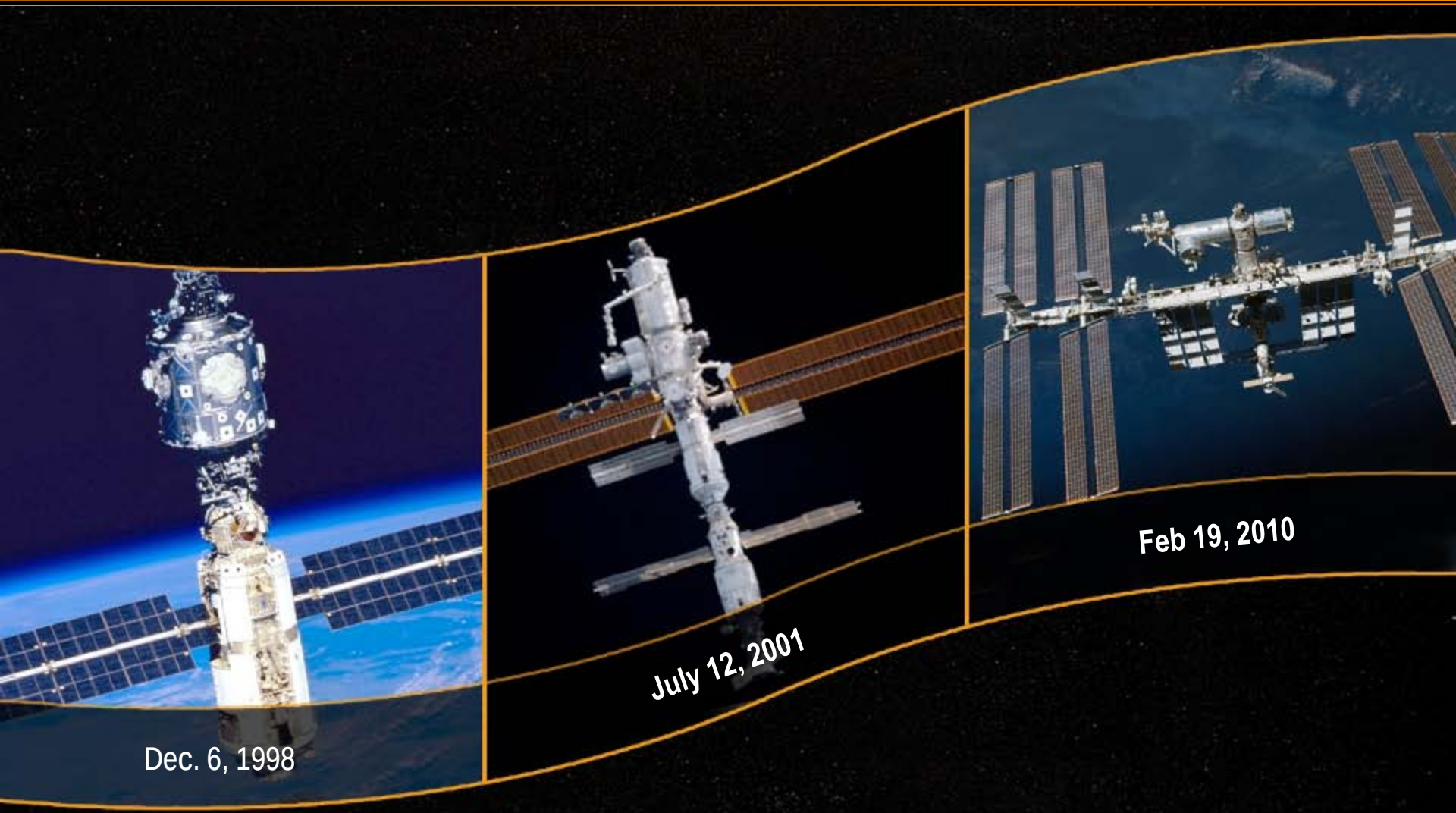
NB-52A, 1959



B-52H Stratofortress,
The longest-serving bomber in U.S. military history

Block upgrades contributed to long-term program success

Building Block Approach



Building success through incremental testing and development

Defining the Path Forward

Expanding Knowledge through Exploration

Mars In Sight

...I believe we can send humans to orbit Mars and return them safely to Earth.

–President Obama
Kennedy Space Center, April 15, 2010

For more information:

www.nasa.gov